What Is Claimed Is:

1. An optical fiber, comprising:
a first region;
a core surrounding the first region, the core comprising an active material; and
a first cladding surrounding the core.

2. The fiber of claim 1 wherein the core is ring-shaped.

3. The fiber of claim 1 wherein the active material comprises rare earth metal ions.

4. The fiber of claim 1 wherein the core comprises a multimode core.

5. The fiber of claim 1 wherein the core comprises a rare earth-doped material.

6. The fiber of claim 1 wherein the core comprises a silica material and ions of a rare earth metal.

7. The fiber of claim 1 wherein the first region comprises a silica 20 material.

8. The fiber of claim 1 wherein the first region has an index of refraction that is less than an index of refraction of the core.

9. The fiber of claim 1 wherein the first cladding comprises a silica material.

10. The fiber of claim 1 wherein the first cladding has an index of refraction that is less than an index of refraction of the core.

11. The fiber of claim 1 comprising a second cladding surrounding the first cladding.

12. The fiber of claim 11 wherein the second cladding comprises a polymer material.

13. The fiber of claim 11 wherein an index of refraction of the first cladding is greater than an index of refraction of the second cladding.

14. The fiber of claim 11 wherein the fiber is a multimode fiber.

15. A system, comprising a first optical fiber, said first optical fiber comprising:

a first region;

a first core surrounding the first region, the core comprising an active material; and

a first cladding surrounding the core; and

a second fiber having a second core, the second fiber being in optical communication with the first fiber so that energy can propagate from one of the cores to the other of the cores.

16. The system of claim 15 wherein the first fiber is a multimode fiber.

17. The system of claim 15 wherein the second fiber is a single mode fiber.

18. The system of claim 15 comprising an energy source.

19. The system of claim 18 comprising a coupler configured to couple energy emitted by the energy source to the first core.

20. The system of claim 18 wherein the core of the first fiber comprises a multimode core.

21. The system of claim 15 wherein the core of the first fiber is ring shaped.

22. The system of claim 15 wherein the active material comprises rare earth metal ions.

23. The system of claim 15 wherein the first core comprises a rare-earth doped material.

24. The system of claim 15 wherein the first region comprises a silica material.

25. The system of claim 15 wherein the first region has an index of refraction that is less than an index of refraction of the core of the first fiber.

26. The system of claim 15 wherein the first cladding comprises a silica material.

27. The system of claim 15 wherein the first cladding has an index of refraction that is less than an index of refraction of the core of the first fiber.

28. The system of claim 15 comprising a second cladding surrounding the first cladding.

29. The system of claim 28 wherein the second cladding comprises a polymer material.

30. The system of claim 28 wherein an index of refraction of the first cladding is greater than an index of refraction of the second cladding.

31. The system of claim 15 wherein the system is arranged in a side pump configuration.

32. The system of claim 15 wherein the system is arranged in an end pump configuration.

33. The system of claim 15 comprising at least one additional fiber.

34. The system of claim 32 wherein the at least one additional fiber comprises a core

in optical communication with the first core so that energy can propagate from one of said cores to the other of said cores.

35. The system of claim 33 wherein the at least one additional fiber is a single mode fiber.

36. The system of claim 33 wherein the at least one additional fiber is a passive single mode fiber.

37. The system of claim 15 wherein the second fiber is a passive single mode fiber.

38. An improved optical fiber having a length, comprising:

a first region comprising a first index of refraction;

a multimode core comprising a second index of refraction that is greater than said first index of refraction, said multimode core disposed about said inner region and capable of focusing energy at locations spaced along the length of said fiber;

a first cladding for receiving pump light, said first cladding disposed about said multimode core and comprising a third index of refraction that is less than said first index of refraction; and

a second cladding disposed about said first cladding, said second cladding for tending to prevent pump light introduced to said inner cladding from escaping said inner cladding.

39. The optical fiber of claim 38 wherein said core comprises a ring shape.

40. The optical fiber of claim 38 wherein said core comprises a rare earth material.

41. The optical fiber of claim 40 wherein said core comprises a ring shape.

42. Optical apparatus, comprising:

a length of a first optical fiber having a wavelength of operation, said first optical fiber comprising

a first region comprising a first index of refraction;

a core comprising a second index of refraction that is greater than said first index of refraction, said core disposed about said inner region and comprising a rare earth material for providing energy having the wavelength of operation responsive to absorbing pump energy having a wavelength different than the wavelength of operation, said core being multimode at said wavelength of operation and being capable of focusing energy at locations spaced along the length of said fiber;

a first cladding for receiving pump light, said first cladding disposed about said multimode core and comprising a third index of refraction that is less than said second index of refraction; and

a second optical fiber comprising a core and a cladding disposed about said core, said core of said second optical fiber being in optical communication with said core of said first optical fiber.

43. The optical apparatus of claim 42 wherein said second optical fiber is a single mode fiber at said wavelength of operation and wherein said core of said second optical fiber is in optical communication with only a part of the cross section of said core of said first optical fiber.

44. The optical apparatus of claim 43 wherein said second fiber comprises a grating capable of reflecting energy having the wavelength of operation.

45. The optical apparatus of claim 42 wherein said second optical fiber is a multimode fiber at said wavelength of operation and wherein said core of said second optical fiber is in optical communication with only a part of the cross section of said core of said first optical fiber.

46. The optical apparatus of claim 45 wherein said second optical fiber comprises a grating capable of reflecting energy having the wavelength of operation.

47. Optical apparatus, comprising:

a length of a first optical fiber having a wavelength of operation, said first optical fiber comprising

a first region comprising a first index of refraction;

a core comprising a second index of refraction that is greater than said first index of refraction, said core disposed about said inner region and comprising a rare earth material for providing energy having the wavelength of operation responsive to absorbing pump energy having a wavelength different than the wavelength of operation, said core being multimode at said wavelength of operation;

a first cladding for receiving pump light, said first cladding disposed about said multimode core and comprising a third index of refraction that is less than said second index of refraction; and

a second optical fiber comprising a core and a cladding disposed about said core, said core of said second optical fiber being connected to only a part of the cross section of said core of said first optical fiber.